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NEW

30. The apparatus of claim 28 wherein the barrier has a thickness that is a multiple of one half of the wavelength of the sonic energy transmitted by the fragile component as the sonic energy travels through the barrier material.

Please amend the drawings as shown in red line on the attached five sheets (FIGS. 1A, 1B, 2, 4 and 5).

REMARKS

Claims 8-15, 17, 20 and 22-30, which include independent claims 8, 13, 17, 20 and 28, are now in this application; new claims 22-30 having been added in this paper, and non-elected claims 1-7, 16, 18-19 and 21 having been canceled in this paper. Claims 13, 17 and 20, objected to but identified as potentially allowable in the present office action, have been rewritten in independent form including all relevant limitations as suggested by the present office action. Claims 8-12 and 15 stand rejected and are now presented for reconsideration in view of the foregoing amendments and the following remarks.

Applicants note with appreciation the Examiner's indication that claims 13, 14, 17 and 20 would be allowable if rewritten to include the limitations of the rejected base claims. Applicants draw the Examiner's attention to the foregoing amendment of claims 13, 17 and 20, via which all relevant limitations have been added and the claims made independent. Claim 14, being dependent on claim 13, has not been amended since claim 13 has been determined to be allowable. Having complied with the Examiner's suggestion in this regard, Applicants respectfully specifically request allowance of claims 13, 14, 17 and 20.

The present Office Action objects to FIGS. 1A-B and 2, stating the figures "should be designated by a legend such as

--prior art-- because only that which is old is illustrated." Applicants agree, and include with the present Amendment a Proposed Drawing Correction including marked-up copies of FIGS. 1A-B and 2.

The present Office Action also objects to the drawings because reference character "115" has been used to designate both a back wall and quartz bars. Upon review of the as-filed application, Applicants agree, and recognize this as a clerical error. Applicants further note a similar clerical error in which reference numeral "117" has been used to designate both a front wall and a net. Accordingly, Applicants have corrected these reference numerals in the marked-up copies of FIGS. 4 and 5 submitted with the Proposed Drawing Correction enclosed herewith. Applicants also draw the Examiner's attention to corresponding reference numeral changes made herein to page 8 of the specification.

Claims 8-10 were rejected in the present Office Action as being allegedly "anticipated by either [U.S. Patent No. 4,869,278 to] Bran" (herein referred to as Bran '278) "or [U.S. Patent No. 5,672,212 to] Manos" (herein referred to as Manos). The Office Action further stated that "[t]he features of claims 8 and 9 are anticipated by either reference regarding the substrate holder in each as the claimed barrier. The quartz plate of claim 10 is disclosed by Bran."

Applicants draw the Examiner's attention to pending claim 8, as amended herein, which recites the claimed barrier, and moreover specifies that the claimed barrier "is positioned so as to protect a central region of the length of the fragile component." Support for the above amendment to claim 8 may be found in prior art FIG. 1B, which shows what is described on page 5, lines 5-30 of the present application as a conventional "bottom roller 17a" that extends to "approximately the middle of the fragile plate 19" and only partially covers the same, and in

FIG. 3A of the present invention inventively showing a corresponding bottom roller (i.e., as the lower extended roller 113 of the two shown) that extends "across the entire width Y of the fragile plate 19" (page 6, lines 22-24) in what is plainly a position that allows for protection of a central region of the length of the fragile plate 19 (FIG. 1B).

Applicants observe that none of the prior art of record appears to disclose or suggest providing a barrier that both extends above at least the width of the fragile component and also is positioned so as to protect a central region of the length of the fragile component. For example, FIGS. 1A and 1B fail to show or suggest a barrier that extends above at least the width of the fragile component. And also for example, if Bran '278 and Manos disclose any "barrier" that extends above at least the width of a fragile component, that barrier is certainly not also "positioned so as to protect a central region of the length of the fragile component" as required by independent claim 8, and by dependent claims 9-12, 15 and 22-27 via their dependency upon claim 8. Applicants therefore submit that claims 8-12, 15 and 22-27, as presently amended, appear to distinguish over each reference in the prior art of record for at least this reason, and respectfully request withdrawal of the present anticipation rejection. Also, because the prior art of record appears to lack any teaching or suggestion to arrive at a combination of elements that amount to that which is presently claimed in claim 8, Applicants observe that a similar rejection based on grounds of § 103(a) obviousness also would be inappropriate.

Additional limitations exist in dependent claims 9-12, 15 and 22-27 that at least distinguish over Bran '278 and Manos. For example, neither reference discloses a barrier as recited in claim 8 that also comprises a substrate support as required by claim 9. As well, neither reference discloses a substrate support as recited in claims 9 and 8 that also comprises an

extended roller as required by claim 11. In addition, neither reference discloses an extended roller as recited in claims 11, 9 and 8 that is also a bottom roller positioned so as to contact a bottom region of a substrate supported thereby as required by claim 25 (see FIG. 1A and page 5, line 18, and FIG. 3A and page 6, lines 13-27).

Claims 11 and 15 were rejected in the present Office Action as being allegedly "unpatentable over Manos in view of [U.S. Patent No. 3,964,957 to] Walsh" (herein referred to as Walsh). Applicants direct the Examiner's attention to the argument above regarding as amended claim 8, which demonstrates that claims 11 and 15, which ultimately depend from claim 8, are also distinguished from the prior art of record, which includes Manos and Walsh.

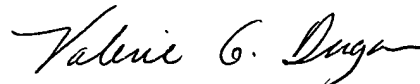
Claim 12 was rejected in the present Office Action as being allegedly "unpatentable over the prior art as applied to claim 11 above, and further in view of either Bran ('278) or [U.S. Patent No. 5,090,432 to] Bran" (referred to herein as Bran '432). Applicants direct the Examiner's attention to the above argument regarding as-amended claim 8, which demonstrates that claim 12, which depends from claim 8, is also distinguished from the prior art of record, which includes both Bran '278 and Bran '432. Further, Applicants note that fragile component 32 of Bran '432 is located outside, not inside, tank 52a.

Finally, Applicants direct the Examiner's attention to new independent claim 28, and submit that it also appears to distinguish over the prior art of record. For example, Applicants observe that the prior art of record appears to fail to disclose or suggest providing a barrier that not only extends above the width of the fragile component, but is also a "bottom roller positioned so as to contact a bottom region of a substrate supported thereby." Applicants therefore respectfully request

allowance of claim 28, as well as of dependent claims 29 and 30, at least because they depend from independent claim 28.

Applicants believe the claims are now in condition for allowance, and respectfully request reconsideration and allowance of the same. Enclosed is a Dugan & Dugan check in the amount of \$168.00 to cover the fee for two additional independent claims. Applicants do not believe any additional fees are due regarding this Amendment. However, if any additional fees are required, please charge Deposit Account No. 04-1696.

Respectfully Submitted,



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Tarrytown, New York

VERSION MARKED TO SHOW CHANGES

IN THE SPECIFICATION:

The paragraph beginning on page 7, line 32 is amended as follows:

The foregoing description discloses only exemplary embodiments of the invention, modifications of the above-disclosed apparatus and method which fall within the scope of the invention will be readily apparent to those of ordinary skill in the art. For instance, in alternative aspects, an inventive megasonic tank 111b may comprise a plurality of quartz bars 119 [115] that extend at or below the elevation of the conventional rollers 17 from one side of the inventive megasonic tank 111b to or nearly to the other side of the inventive megasonic tank 111b as shown in FIG. 4, or a net 121 [117] that may be coupled to chamber walls and extend so as to catch falling objects as shown in FIG. 5. It will be understood that the quartz bars 119 [115] and the net 121 [117] are sufficiently thick such that a falling object may not break the quartz bars 119 [115] or the net 121 [117] upon contact therewith.

The paragraph beginning on page 8, line 24 is amended as follows:

Both the quartz bars 119 [115] and the net 121 [117] may protect other components of the inventive megasonic tank 111b in addition to the fragile plate 19. Further, in one aspect, the portion of the extended roller 113 which extends beyond the extended roller 113's wafer supporting portion 18, may be coupled, via a mechanism (e.g., screws, etc.) to the conventional rollers 17 making the conventional rollers 17 easy to retrofit. Finally, the fragile object may comprise objects other than a quartz plate (such as the transducer(s) itself, a sensor, etc.).

It will be understood, however, that a lid and/or slideable door is not a barrier.

AMENDED 8. An apparatus configured to clean a semiconductor substrate, comprising:

 a tank configured to contain a liquid the tank having an opening configured to allow a substrate to enter the tank from a position above the tank;

 a fragile component contained in the tank, positioned within the footprint of the opening and configured to transmit sonic energy; and

 a barrier that extends above at least the width of the fragile component and is positioned so as to protect a central region of the length of the fragile component.

AMENDED 13. [The apparatus of claim 12 wherein] An apparatus configured to clean a semiconductor substrate, comprising:

a tank configured to contain a liquid, the tank having an opening configured to allow a substrate to enter the tank from a position above the tank;

a fragile component contained in the tank, positioned within the footprint of the opening, and configured to transmit sonic energy; and

a barrier that extends above at least the width the fragile component;

wherein:

the fragile component comprises a quartz plate; and

the barrier comprises a substrate support, the substrate support comprises an extended roller, and the extended roller comprises a hollow extension.

AMENDED/ALLOWABLE 17. [The apparatus of claim 8] An apparatus configured to clean a semiconductor substrate, comprising:
a tank configured to contain a liquid, the tank having an opening configured to allow a substrate to enter the tank from a position above the tank;
a fragile component contained in the tank, positioned within the footprint of the opening, and configured to transmit sonic energy; and
a barrier that extends above at least the width the fragile component;
wherein the barrier is configured so as to be transparent to the sonic energy transmitted by the fragile component.

AMENDED/ALLOWABLE 20. [The apparatus of claim 8] An apparatus configured to clean a semiconductor substrate, comprising:
a tank configured to contain a liquid, the tank having an opening configured to allow a substrate to enter the tank from a position above the tank;
a fragile component contained in the tank, positioned within the footprint of the opening, and configured to transmit sonic energy; and
a barrier extending above at least the width the fragile component;
wherein the barrier has a thickness that is a multiple of one half of the wavelength of the sonic energy transmitted by the fragile component as the sonic energy travels through the barrier material.